

## **Rabbit Genes**

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There are 11 color gene groups in rabbits known so far. They are A, B, C, D, E, En, Du, Si, V, W, and P. There are also recessive forms of these genes. On top of these, there are also modifiers, which modify a certain gene(s). These include the rufous modifiers, color intensifiers, and plus/minus (blanket/spot) modifiers. A rabbit's coat only has two pigments, yellow and dark brown. There can also be no pigment, causing an albino or white rabbit.

<b><u>Gene</u></b>	<b><u>Description</u></b>	<b><u>Examples</u></b>
<b>A</b>	Agouti: light eye circles, belly, and triangles. Has banding on hair shaft.	Chestnut, Opal, Orange, Lynx, Chinchilla
<b>a<sup>t</sup></b>	Tan Pattern: Solid color, has tan, fawn, or white eye circles, belly, and triangles.	Silver Martin, Tan, Otter
<b>a</b>	Self: No banding on hair shaft, one color throughout	Blue, Chocolate, Black, Tort
<b>B</b>	Black: When present with Agouti gene, causes a black band, when present with the Self gene, produces one solid color.	Black, Chestnut
<b>b</b>	Brown (or Chocolate): With Agouti, makes the black band brown, when present with the Self gene, makes solid chocolate instead of black.	Chocolate, Lynx
<b>C</b>	Full Color: All four dark brown and all three yellow pigments bands to be present. Completely dominant.	Any color except Chinchilla (light or dark) or REW.
<b>c<sup>ch3</sup></b>	Dark Chinchilla: Same as full color, except only one yellow pigment band. Dominant over c <sup>ch2</sup> , c <sup>ch1</sup> , c <sup>ch</sup> , and c. Denoted by some breeders as c <sup>chd</sup> ("dark chinchilla"), however this is not correct according to the Genetic Society of America.	Chinchilla, Squirrel

<b>c<sup>ch2</sup></b>	Light Chinchilla: Slight reduction in dark brown pigment creating a more sepia tone in the fur rather than black. No yellow pigment has been observed. Denoted by some breeders as c <sup>chm</sup> ("medium chinchilla"), however this is not correct according to the recommendations of the Genetic Society of America.	Some chinchillas, especially in colder climates, may be of this genotype. However, it is not preferred.
<b>c<sup>ch1</sup></b>	Pale Chinchilla: Only allows two dark brown pigments and no yellow pigments, which lightens the color. Incompletely dominant, is dominant over only the c <sup>h</sup> and c genes. Denoted by some breeders as c <sup>chl</sup> ("light chinchilla", or "shaded"), however these nomenclatures are not correct according to the recommendations of the Genetic Society of America.	Sable Point, Siamese Sable, Smoke Pearl
<b>c<sup>h</sup></b>	Himalayan (Pointed White): Causes the color to be only on the "points"; ears, nose, feet, and tail. Can produce red eyes. Dominant only over the c gene.	Pointed White, Himalayan, Californian
<b>c</b>	Albino: Stops all color from being expressed. Produces a white rabbit with red eyes.	Ruby-eyed White
<b>D</b>	Dense Coat: Full color, much like the dominant C gene. Eyes are brown.	Orange, Chestnut, Tort
<b>d</b>	Dilute: Much like its name, it dilutes the color (e.g. Black to Blue, Chocolate to Lilac, etc.). Eyes: Blue-gray	Cream, Lilac, Blue, Opal
<b>E<sup>D</sup></b>	Dominant Black: Exactly like it's name, it is completely dominant and will turn even a chestnut/agouti into a black looking rabbit.	Common in Havanas, English Spots
<b>E<sup>s</sup></b>	Steel: When Agouti is present, covers up the middle band of dark pigment and darkens the eye circles, belly, and triangles. Lesser variant of Dominant Black, it leaves a ticking effect.	Gold Tipped Steels, Blue Tipped Steels

<b>E</b>	Normal Extension: Works with the C loci, lets the dark brown pigment be fully expressed	Black, Blue, Chocolate, Lilac, Siamese Sable
<b>e<sup>j</sup></b>	Japanese Brindling: Works with Agouti to allow the dark brown and yellow pigments to stay in separate areas instead of on the same hair shaft (like a mosaic).	Harlequin, Tri-Color, Magpie
<b>e</b>	Non-Extension: Works with the C loci and modifiers to remove most or all of the dark pigment leaving only the yellow pigment.	Red, Orange, Fawn, Cream
<b>En</b>	English Spotting: Causes white spots within the solid color, also called Broken. Works with the plus/minus modifiers to intensify or decrease the amount of white.	English Spot, Tri-color, any Broken EnEn = "Charlie", too much white
<b>en</b>	Self-Colored: Normal color, no white spots	Any selfs. Enen = normal broken, enen=self.
<b>Du</b>	Absence of Dutch Pattern: Causes a "normal" colored rabbit, no partial white/color pattern.	
<b>du<sup>d</sup></b>	Dutch Pattern (dark): Causes a pattern where there is a white triangle on the face, white belt around the middle, and white boots on the back feet.	Dutch
<b>du<sup>w</sup></b>	Dutch Pattern (white): Causes a pattern with a very white body and not much color, color usually on the face and lower rump area.	Used in dwarf hotots
<b>V</b>	Absence of Vienna White: "normal" colored rabbit. VV will result in a "normal" rabbit.	Vv = patches of white like the dutch pattern
<b>v</b>	Vienna White: Causes a white rabbit with blue eyes.	vv = Blue Eyed White (BEW)

<b>W</b>	Normal Width: Normal coloring, allows the middle yellow or white band to remain the same.	Agouti, Chinchilla
<b>w</b>	Wideband: Allows the middle yellow or white band to double, which colors the agouti pattern areas (triangles, eye circles, and belly).	New Zealand Red, Thrianta
<b>Si</b>	Non-Silvering: Has no effect on color	Basically all rabbits
<b>si</b>	Silver: Creates silver-white tipped hairs and silver-white hairs that intermingle with the normal colored hairs in the coat.	Silver Martin, Silver Fox
<b>P</b>	No P Mutation: No effect on color	Basically all rabbits
<b>p</b>	P Mutation: Decreases dark brown pigment and changes eyes to pink	Lutino, Shaddow